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## SCIENCE:

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## CORN CANE.\*

BY F. L. STEWART, MURRYSVILLE, PA.

THE numerous varieties of maize now grown throughout the United States may conveniently be divided into a few general groups, easily distinguishable by the form and qualities of the grain.†

The most prominent of these are the Dents (white and yellow), Flint, Popcorn and the so-called sweet varieties. Since all sorts, however unlike otherwise, conform to the principle that the arrested development of the seed at the period above indicated, produces sugar accumulation in the cells of the stalk, and since it has been found that the sugar percentage is about the same in all at corresponding periods, it follows that the choice of the sugar planter, among the different kinds, must rest upon the most vigorous and well developed of the large-stemmed varieties that will mature their juice in any given locality. The people of our more northern States make a mistake in regarding the hard-glazed or "Flint" varieties of field corn, which are largely grown in that climate, as the best types of the species, naturally, and as bearing the best commercial type of the grain. Our western growers have already established a different standard, one which obtains now for American corn throughout the world and comes almost exclusively from the "Dent" group.

The best representatives of the species, both as regards vigorous growth and the nutritive qualities of the grain, are undoubtedly the large southern varieties, white and yellow. Maize is naturally a sub-tropical plant, but being an annual, ripening within a single season, our peculiar summer climate enables us to grow it to perfection under directly sub-tropical conditions; and in proportion as the Dent corn of the west and southwest approaches the southern type more closely in luxuriance of growth and the softer quality of the grain, does it increase in productiveness and nutritive value.

Among the different races of corn now existing the matured grain varies wonderfully, both in external qualities and composition, ranging from the "sweet" corn, with its permanently soft grain, richly charged with readily soluble food materials, on the one hand, to the "Flint" corn of New England on the other, yet the ear of the latter, in its immature stage, is but slightly different in com-

position and quality from that of the immature sweet corn.

It is not a little remarkable that this period of arrested development is the only period when the grain of all varieties may be said to have a common character. Experiments in stock feeding, as well as analytical results, show that it is then also in its most available nutritious condition.

This stage now proves, also, to be a turning point in the life and economic use of the individual plant, when an alternative is significantly presented to the choice of the grower. The prompt separation of the ear at this stage conditions the full development of the sugar and the prolonged existence of the plant. But if the grain be allowed to glaze nothing can avert the almost immediate death of the plant and, excepting the seed, the destruction of the whole organized structure.

In the former case the result is equally certain and absolute. The saccharine development may be depended upon to go on until it has reached its limit, and it is as fixed and constant an attribute of the whole species as it is in the maturing joints of the sugar cane itself.

It remains for me only to indicate, in the briefest way possible, what is necessary now, practically, to make sugar manufacture a success from this new source.

First in importance is the answer to the question what varieties to plant that are best for this use. No one sort can be named which is equally well adapted for all localities, even in the main central corn belt of the United States. Everywhere in that region the period of juice-ripening is naturally brought to an end only by the frosts. Corn cane is nearly as sensitive to severe cold as the sugar cane, and throughout that region generally the aim should be to plant such varieties as will develop the milky condition of the grain by the 20th of August, so as to insure a period of two weeks for sugar accumulation by the first week in September, when the manufacturing season for the main crop would regularly begin. The following well-known sorts sufficiently matured their juice last season early in September, and most of them can be recommended for this use from Ohio westward and southward, ranking them in that region in the order named:

1. Large Southern White or Virginia fodder corn.
2. Burpee's Golden Beauty, a highly improved and well established variety of the yellow Dent.
3. Chester County Mammoth.
4. Kansas Yellow Dent.
5. Early Mastodon Dent.

The first named is the best ensilage corn grown, and wherever it will mature its ears to the roasting ear condition in August it will have the preference in sugar manufacture on account of its great productiveness and the richness of its juice. Golden Beauty has been tested from the outset of these experiments in 1884, and with the very best results. Like all the rest named, its stems are very robust, well developed stalks when trimmed weighing three pounds.

After these, but not ranking with them at all in productiveness, Stowell's Evergreen-Egyptian and Mammoth Sugar, among the sweet corn group, may be named. Their juice is not superior to that of field corn in any quality. I have no question that by selection and inter-crossing a variety of sweet corn will yet be produced which will be as productive of grain for canners' use as any that we now have and equal to the field varieties in robust stem-growth. For the sugar crop, no special preparation of the soil is needed other than is commonly required to produce a heavy crop of field corn. The seed should be sown in drills three and a half or four feet apart, and thickly enough for the plants to stand about ten inches apart in the row.

\*Continued from Science, Sept. 22.

†Dr. E. L. Sturtevant, while in charge of the New York Experiment Station, corrected the nomenclature of maize and originated a system of classification, deriving the distinctive characters from the structure of the kernel or grain. The arrangement seems to be a natural one otherwise, and his definitions of the varieties then existing are very valuable now for purposes of identification, although some new ones have originated since then. (N. Y. State Expt. Reports for 1883 and 1884.)